IN THE CLAIMS

1. (Currently Amended) A method of assessing the effect of a test condition on G-protein-coupled receptor (GPCR) pathway activity, comprising:

a) providing a cell that expresses a GPCR as a fusion protein to a first mutant form of a reporter enzyme and an interacting protein partner as a fusion protein to a second mutant form of the reporter enzyme;

b) exposing the cell to a ligand for said GPCR under said test condition; and

c) detecting enzymatic activity of the reporter enzyme;

wherein increased reporter enzyme activity in the cell compared to that which occurs in the absence of said test condition indicates increased GPCR interaction with its interacting protein partner compared to that which occurs in the absence of said test condition, and decreased reporter enzyme activity in the cell compared to that which occurs in the absence of said test condition indicates decreased GPCR interaction with its interacting protein partner compared to that which occurs in the absence of said test condition;

wherein the protein partner is an arrestin and wherein the GPCR and the first mutant form of reporter enzyme are linked together by a polypeptide linker represented by the formula -$(GGGGS)_n$-.

2. (Original) A method according to Claim 1, wherein the test condition is the presence in the cell of a kinase.

3. (Original) A method according to Claim 1, wherein the test condition is the presence in the cell of a G-protein.

~~4. (Original) A method according to Claim 1, wherein the test condition is the exposure~~ of the cell to a compound selected from GPCR agonists and GPCR antagonists.

5. (Original) A method according to Claim 1, wherein the test condition is co-expression in the cell of a second receptor.

6. (Original) A method according to Claim 5, wherein the second receptor is a GPCR receptor.

7. (Original) A method according to Claim 5, wherein homo-dimerization of GPCR is determined.

8. (Original) A method according to Claim 5, wherein hetero-dimerization of GPCR is determined.

9. (Currently Amended) A method for screening a β-arrestin protein for the ability to bind to activated GPCRs, comprising:

a) providing a cell that:

i) expresses at least one GPCR as a fusion protein to a first mutant form of a reporter enzyme; and

ii) contains a conjugate comprising a test β-arrestin protein as a fusion protein with a second mutant form of the reporter enzyme;

b) exposing the cell to a ligand for said at least one GPCR; and

c) detecting enzymatic activity of the reporter enzyme;

wherein an increase in enzymatic activity in the cell indicates β-arrestin protein binding to the activated GPCR;

wherein the GPCR and the first mutant form of reporter enzyme are linked together by a polypeptide linker represented by the formula -$(GGGGS)_n$-.

10. (Currently Amended) A method for screening a test compound for G-protein-coupled receptor (GPCR) agonist activity, comprising:

a) providing a cell that expresses a GPCR as a fusion protein to a first mutant form of a reporter enzyme and an arrestin protein as a fusion protein to a second mutant form of the reporter enzyme;

b) exposing the cell to a test compound; and

c) detecting enzymatic activity of the reporter enzyme;

wherein increased reporter enzyme activity after exposure of the cell to the test compound indicates GPCR agonist activity of the test compound;

wherein the GPCR and the first mutant form of reporter enzyme are linked together by a polypeptide linker represented by the formula -$(GGGGS)_n$-.

11. (Original) A method according to Claim 10, wherein the cell expresses a GPCR whose function is known.

12. (Original) A method according to Claim 10, wherein the cell expresses a GPCR whose function is unknown.

13. (Original) A method according to Claim 10, wherein the cell expresses an odorant or taste GPCR.

14. (Previously Presented) A method according to Claim 10, wherein the cell expresses a β-adrenergic receptor.

15. (Original) A method according to Claim 10, wherein the cell is selected from the group consisting of mammalian cells, cells of invertebrate origin, plant cells and protozoa cells.

~~16. (Original) A method according to Claim 10, wherein the cell endogenously expresses~~ a GPCR.

17. (Original) A method according to Claim 10, wherein the cell has been transformed to express a GPCR not endogenously expressed by such a cell.

18. (Currently Amended) A method of screening a test compound for G-protein-coupled receptor (GPCR) antagonist activity, comprising:

a) providing a cell that expresses a GPCR as a fusion protein to a first mutant form of a reporter enzyme and an arrestin protein as a fusion protein to a second mutant form of the reporter enzyme;

b) exposing the cell to said test compound;

c) exposing the cell to an agonist for said GPCR; and

d) detecting complementation of said reporter enzyme;

where exposure to the agonist occurs at the same time as, or subsequent to, exposure to the test compound, and wherein decreased reporter enzyme activity after exposure of the cell to the test compound indicates that the test compound is an antagonist for said GPCR;

wherein the GPCR and the first mutant form of reporter enzyme are linked together by a polypeptide linker represented by the formula -$(GGGGS)_n$-.

19. (Cancelled)

20. (Currently Amended) A method of screening a plurality of cells for those cells which contain a G-protein-coupled receptor (GPCR) responsive to a GPCR ligand, the method comprising:

a) providing a plurality of cells that express the GPCR as a fusion protein to a first mutant form of reporter enzyme and a binding partner of the GPCR as a fusion protein to a ~~second mutant form of the enzyme complementary to the first mutant form of the enzyme;~~

b) exposing the cells to a GPCR ligand; and

c) detecting enzymatic activity of the reporter enzyme;

wherein an increase or decrease in enzymatic activity after exposure of the cell to the GPCR ligand indicates that the cell contains a GPCR responsive to the ligand;

wherein the binding partner is an arrestin and;

wherein the GPCR and the first mutant form of reporter enzyme are linked together by a polypeptide linker represented by the formula -$(GGGGS)_n$-.

21. (Original) A method according to Claim 20, wherein the plurality of cells are contained in a tissue.

22. (Original) A method according to Claim 20, wherein the plurality of cells are contained in an organ.

23. (Original) A method according to Claim 20, wherein step (b) comprises exposing the cells to a plurality of GPCR agonists or ligand libraries.

24. (Currently Amended) A substrate having deposited thereon a plurality of cells, said cells expressing at least one GPCR as a fusion protein to [[one]] a first mutant form of reporter enzyme and an arrestin protein as a fusion to ~~another~~ a second mutant form of the reporter enzyme wherein the GPCR and the first mutant form of reporter enzyme are linked together by a polypeptide linker represented by the formula -$(GGGGS)_n$-.

25. (Original) A substrate according to Claim 24, wherein the substrate contains an enzyme-labile chemical group which, upon cleavage by the reporter enzyme, releases a product measurable by colorimetry, fluorescence or chemiluminescence.

26. (Previously Presented) A substrate according to Claim 24, wherein the substrate is made of organic compounds or synthetic polymers, or from a material selected from glass, plastic, ceramic, semiconductor, silica, fiber optic, diamond, ~~biocompatible monomer and~~ biocompatible polymer materials.

27 - 30 (Cancelled)

31. (Previously Presented) The method of Claim 20, wherein enzyme activity is detected in a mixture of the plurality of cells.

32. (Previously Presented) The method of Claim 20, further comprising isolating clones of individual cells, wherein enzyme activity is detected in the clones of individual cells.

33. (Previously Presented) The method of Claim 20, wherein the binding partner is a cellular component that directly or indirectly modulates GPCR activation or inactivation.

34. (Cancelled)

35. (Previously Presented) The method of Claim 20, wherein the plurality of cells express multiple GPCRs, each as a fusion protein to the first mutant form of reporter enzyme.

36. (Previously Presented) The method of Claim 10, wherein the cell endogenously expresses multiple G-protein-coupled receptors.

37. (Previously Presented) The method of Claim 20, wherein the GPCR and the binding partner interact as a result of the ligand binding to the GPCR.

38. (Cancelled)

39. (Currently Amended) The method of Claim [[38]] 10, wherein n is 2 or more.

40. (Currently Amended) The method of Claim [[38]] 10, wherein n is 4.

41. (Previously Presented) The method of Claim 10, wherein the second mutant form of the reporter enzyme is linked to the C-terminal of the arrestin protein.

42 - 43 (Cancelled)

44. (Currently Amended) The method of Claim [[43]] 1, wherein n is 2 or more.

45. (Currently Amended) The method of Claim [[43]] 1, wherein n is 4.

46. (Currently Amended) The method of Claim [[42]] 1, wherein the second mutant form of the reporter enzyme is linked to the C-terminal of the arrestin protein.

47. (Cancelled)

48. (Currently Amended) The method of Claim [[47]] 9, wherein n is 2 or more.

49. (Currently Amended) The method of Claim [[47]] 9, wherein n is 4.

50. (Previously Presented) The method of Claim 9, wherein the second mutant form of the reporter enzyme is linked to the C-terminal of the arrestin protein.

51. (Previously Presented) The method of Claim 9, wherein the β-arrestin protein is an unidentified β-arrestin, a β-arrestin fragment or a mutant form of a β-arrestin protein.

52. (Cancelled)

53. (Currently Amended) The method of Claim [[52]] 18, wherein n is 2 or more.

54. (Currently Amended) The method of Claim [[52]] 18, wherein n is 4.

55. (Previously Presented) The method of Claim 18, wherein the second mutant form of the reporter enzyme is linked to the C-terminal of the arrestin protein.

56. (Cancelled)

57. (Currently Amended) The method of Claim [[56]] 20, wherein n is 2 or more.

58. (Currently Amended) The method of Claim [[56]] 20, wherein n is 4.

59. (Currently Amended) The method of Claim [[34]] 20, wherein the second mutant form of the reporter enzyme is linked to the C-terminal of the arrestin protein.